

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

BIOLOGY

0610/01

Paper 1 Multiple Choice (Core)

October/November 2005

45 minutes

Additional Materials: Multiple Choice Answer Sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.

Do not use staples, paper clips, highlighters, glue or correction fluid.

Write your name, Centre number and candidate number on the answer sheet in the spaces provided unless this has been done for you.

There are **forty** questions on this paper. Answer **all** questions.

For each question there are four possible answers **A, B, C** and **D**. Choose the **one** you consider correct and record your choice in **soft pencil** on the separate answer sheet.

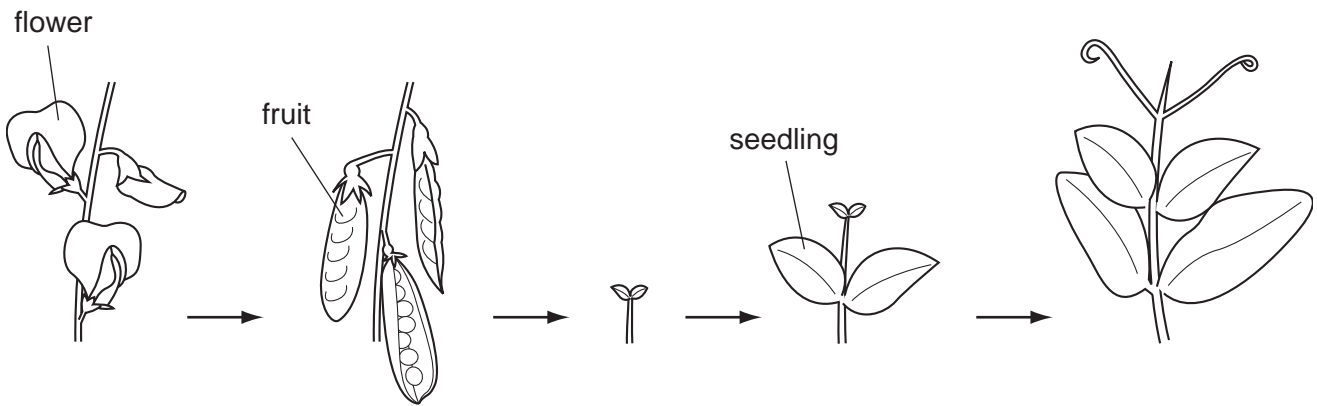
Read the instructions on the answer sheet very carefully.

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
Any rough working should be done in this booklet.

This document consists of **15** printed pages and **1** blank page.



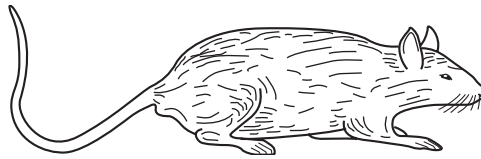
1 The diagrams show two characteristics of living organisms.



Which characteristics are shown?

- A excretion and growth
- B growth and reproduction
- C reproduction and respiration
- D respiration and excretion

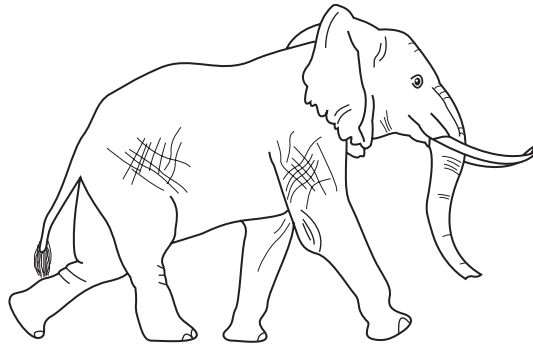
2 The diagram shows some external features of a rat.



Which features, seen in the diagram, show that a rat is a mammal?

- A two external ears and two eyes
- B fur and whiskers
- C tail and four legs
- D milk and sweat production

- 3 The diagram shows an animal whose scientific name is *Loxodonta africana*.



To which species does it belong?

- A *africana*
 - B *Loxodonta*
 - C mammal
 - D vertebrate
- 4 The diagram shows part of a flowering plant.

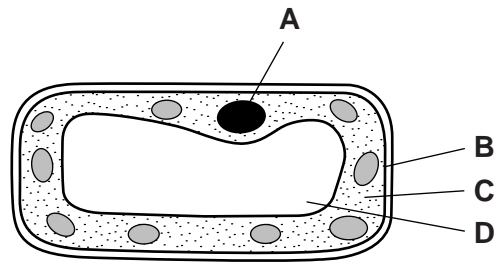


Using the key, identify this plant.

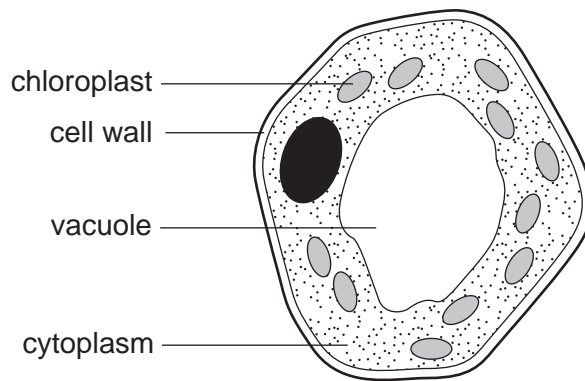
- 1 three petals go to 2
- more than three petals go to 3
- 2 leaves longer than they are wide **A**
- leaves wider than they are long **B**
- 3 leaves parallel-veined **C**
- leaves not parallel-veined **D**

5 The diagram shows a palisade cell.

Which part contains chromosomes?



6 The diagram shows a cell from the stem of a plant.



Which of the parts would **not** be found in a cell from the root?

- A chloroplast
- B cell wall
- C cytoplasm
- D vacuole

7 The table shows features that may be found in living cells.

Which features are found in a liver cell?

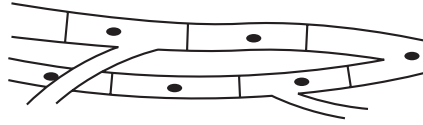
| | large central vacuole | chloroplasts | cellulose cell wall |
|----------|-----------------------|--------------|---------------------|
| A | ✓ | ✓ | ✓ |
| B | ✓ | ✓ | x |
| C | x | x | ✓ |
| D | x | x | x |

key

✓ = found

x = not found

- 8 The diagram shows some heart muscle cells.



Which describes the level of organisation of these cells and their specific function?

| | level of organisation | specific function |
|----------|-----------------------|-------------------|
| A | organ | contraction |
| B | organ | support |
| C | tissue | support |
| D | tissue | contraction |

- 9 Which features are present in red blood cells and are also present in nerve cells?

| | cell membrane | nucleus |
|----------|---------------|---------|
| A | ✓ | ✓ |
| B | ✓ | x |
| C | x | ✓ |
| D | x | x |

key

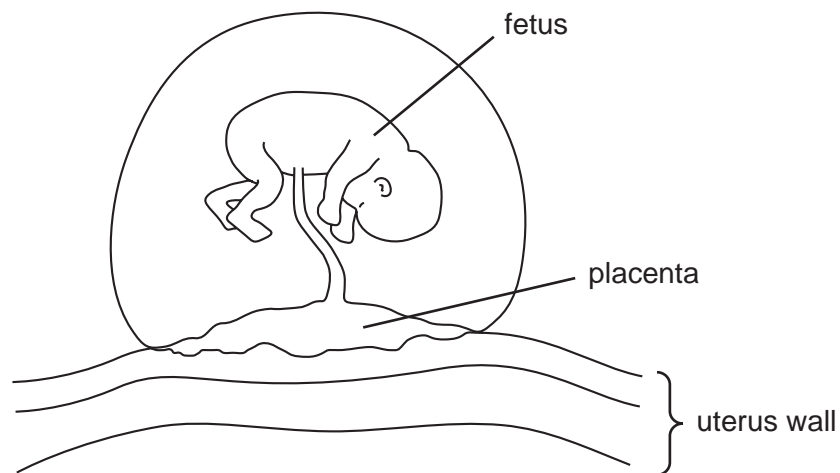
✓ = present

x = not present

- 10 Why does a red blood cell burst when placed in water?

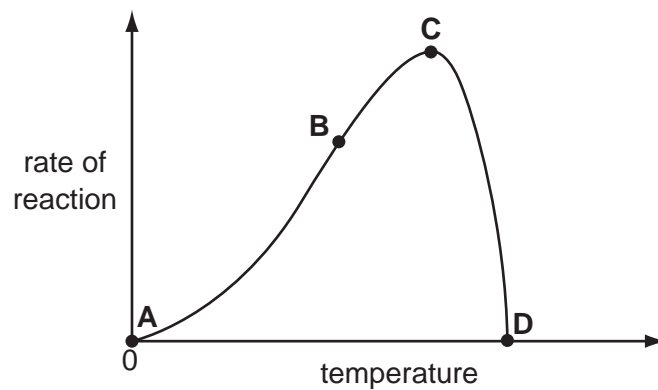
- A** Dissolved substances diffuse into the cell.
- B** Dissolved substances diffuse out of the cell.
- C** Water diffuses into the cell.
- D** Water diffuses out of the cell.

11 The diagram shows a fetus attached by the placenta to the uterus wall.



By which process do all substances pass between the placenta and the uterus wall?

- A diffusion
 - B nutrition
 - C osmosis
 - D respiration
- 12 During digestion, large molecules are broken into smaller molecules by which of the following?
- A bile
 - B enzymes
 - C peristalsis
 - D teeth
- 13 The graph shows the rate of an enzyme-controlled reaction at different temperatures.
- Which point on the graph shows that the enzyme has been denatured (destroyed)?



14 What is needed in the diet of a man working hard in a hot climate?

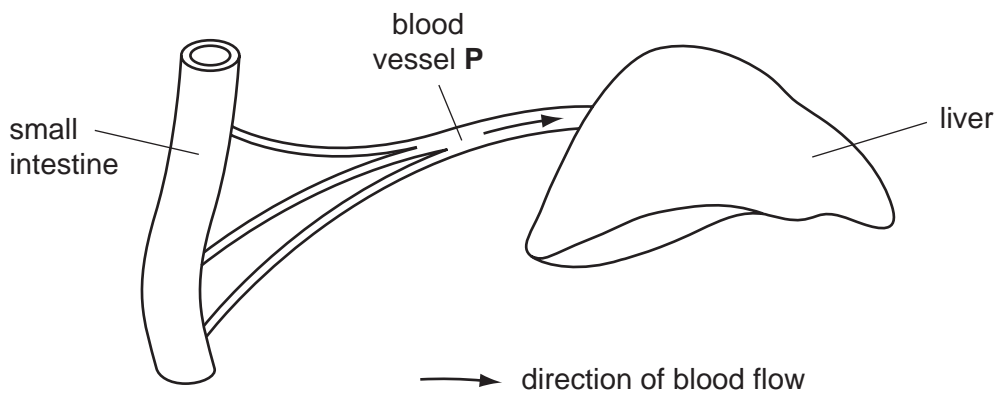
| | high energy intake | protein | extra water |
|----------|--------------------|---------|-------------|
| A | ✓ | ✓ | x |
| B | ✓ | x | ✓ |
| C | ✓ | ✓ | ✓ |
| D | x | ✓ | ✓ |

key

✓ = needed

x = not needed

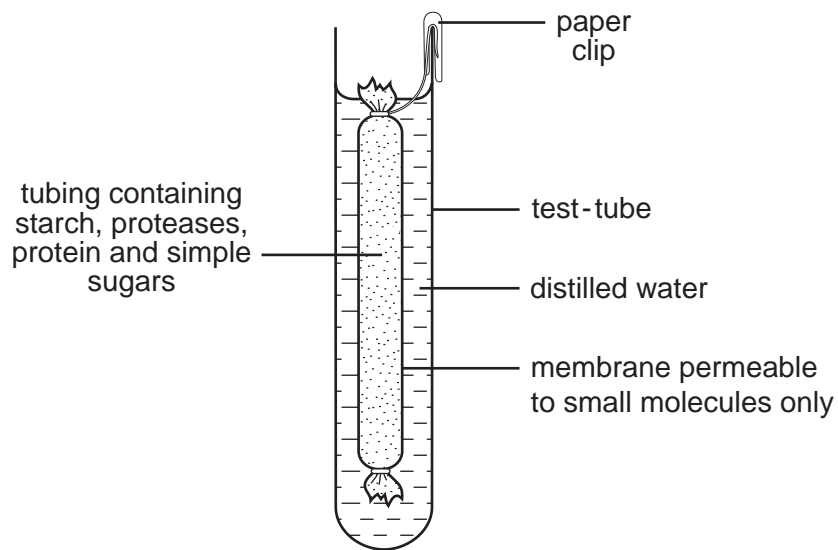
15 The diagram shows the small intestine, the liver and blood vessel **P** that joins them.



Which carbohydrate is found in blood vessel **P** and which carbohydrate is found in the liver?

| | blood vessel P | liver |
|----------|-----------------------|----------|
| A | glucose | glycogen |
| B | glucose | starch |
| C | maltose | glycogen |
| D | maltose | starch |

16 The diagram shows some apparatus set up and kept at room temperature.



What is present in the water surrounding the membrane after 45 minutes?

- A amino acids and simple sugars
- B protein and amino acids
- C protein and simple sugar
- D starch and simple sugars

17 Which cells pass from blood, through capillary walls, to tissues?

| | white blood cells | red blood cells |
|----------|-------------------|-----------------|
| A | ✓ | ✓ |
| B | ✓ | x |
| C | x | ✓ |
| D | x | x |

key

✓ = pass

x = do not pass

18 The table shows the rates of water uptake and transpiration of a plant during a morning.

| time | 09.00 | 10.00 | 11.00 | 12.00 |
|---|-------|-------|-------|-------|
| rate of water uptake / cm ³ per hour | 15 | 16 | 16 | 17 |
| transpiration / cm ³ per hour | 7 | 12 | 16 | 19 |

At what time does the plant show signs of wilting?

- A 09.00
- B 10.00
- C 11.00
- D 12.00

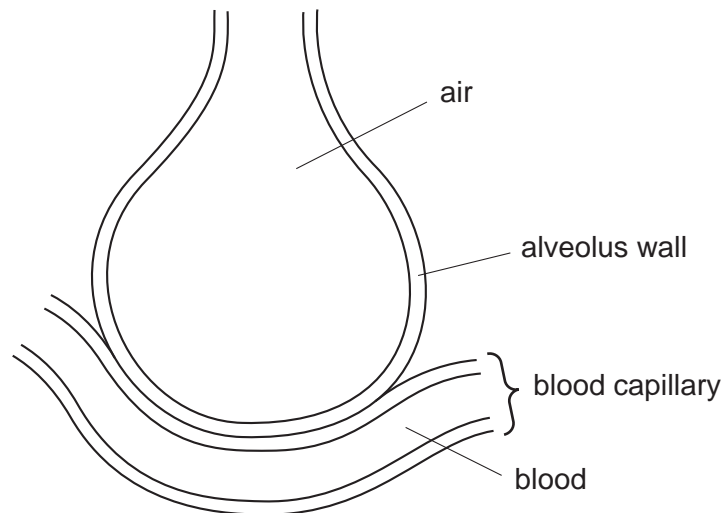
19 What describes anaerobic respiration?

| | energy released | oxygen required | waste products |
|----------|-----------------|-----------------|--------------------------|
| A | a little | no | lactic acid |
| B | a little | yes | carbon dioxide and water |
| C | a lot | no | lactic acid |
| D | a lot | yes | carbon dioxide and water |

20 What happens to the depth and rate of breathing during increased physical activity?

| | depth | rate |
|----------|----------|----------|
| A | decrease | decrease |
| B | decrease | increase |
| C | increase | decrease |
| D | increase | increase |

21 The diagram shows a gaseous exchange surface (alveolus) and part of a nearby capillary.



What would increase the rate of absorption of oxygen into the capillary?

- A** increasing the thickness of alveolus wall
- B** increasing the surface area of alveolus wall
- C** lowering the concentration of oxygen in the alveolus
- D** slowing down the rate of breathing

- 22 One body process is defined as the removal of toxic materials, the removal of waste products of metabolism and removal of substances in excess.

Of which process is this a definition?

- A excretion
- B nutrition
- C reproduction
- D respiration

- 23 What happens when the body temperature rises above normal?

| | blood vessels in the surface of skin | sweat production |
|----------|--------------------------------------|------------------|
| A | dilate | decreases |
| B | constrict | increases |
| C | constrict | decreases |
| D | dilate | increases |

- 24 The table shows the composition of the urine of four people.

Which person is most likely to have been eating a lot of protein on a hot, dry, day?

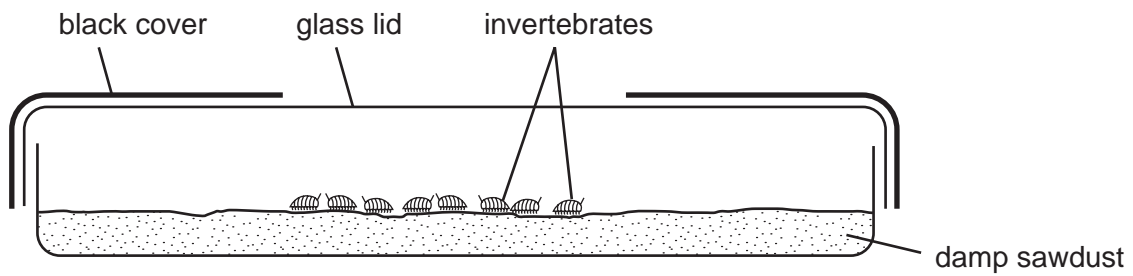
| person | urea content of urine | water content of urine |
|----------|-----------------------|------------------------|
| A | high | high |
| B | high | low |
| C | low | high |
| D | low | low |

- 25 What shows the order in which these structures are involved in a reflex action?

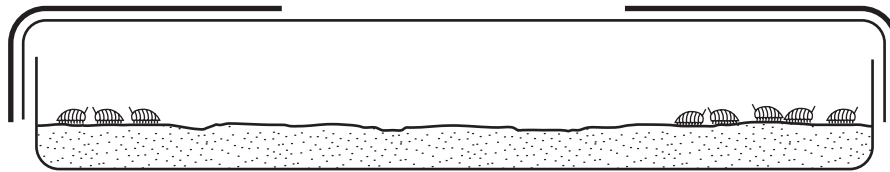
start \longrightarrow finish

- A effector \rightarrow motor neurone \rightarrow relay neurone \rightarrow sensory neurone \rightarrow receptor
- B effector \rightarrow sensory neurone \rightarrow motor neurone \rightarrow relay neurone \rightarrow receptor
- C receptor \rightarrow sensory neurone \rightarrow relay neurone \rightarrow motor neurone \rightarrow effector
- D receptor \rightarrow motor neurone \rightarrow sensory neurone \rightarrow relay neurone \rightarrow effector

26 The diagrams show invertebrates in a glass container in the light.



at the beginning of the experiment



after thirty minutes

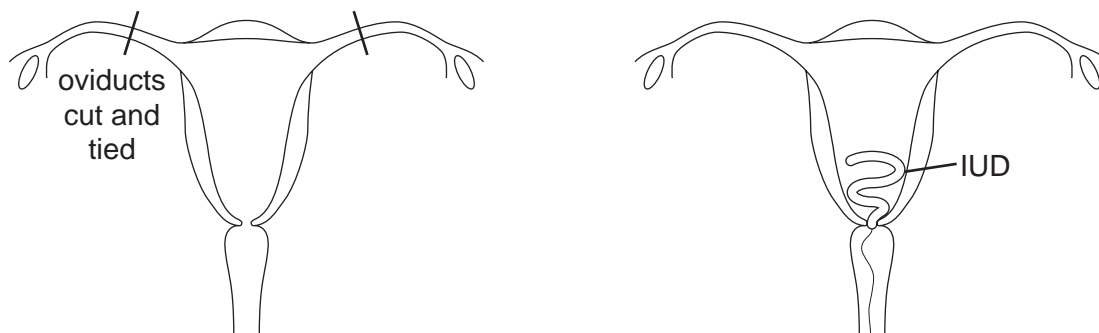
Which response is shown by the animals?

- A negative phototaxis
- B negative phototropism
- C positive phototaxis
- D positive phototropism

27 Which statement about sexual reproduction is correct?

- A Gametes are produced by mitosis only.
- B Gametes fuse together to form a zygote.
- C Genetically identical nuclei are produced.
- D It occurs in animals, but not in plants.

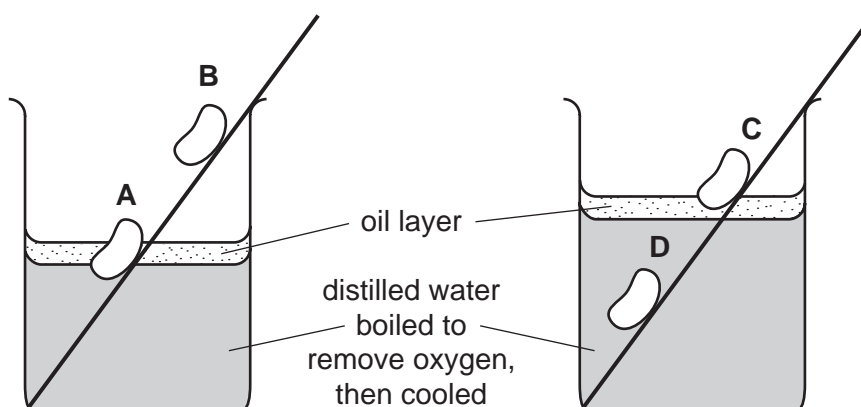
28 The diagrams show two methods of birth control.



Which methods are illustrated?

- A mechanical and chemical
 - B mechanical and surgical
 - C natural and mechanical
 - D natural and surgical
- 29 What is the dry mass of a plant?
- A Its mass, after all the organic matter has been removed from it by heating.
 - B Its mass, after all the water has been removed from it by heating.
 - C Its mass, after it has not been watered for several days.
 - D Its mass, after its leaves and roots have been gently dried.
- 30 The experiment shown in the diagram was set up to investigate the conditions required for the germination of bean seeds.

Which seed would be most likely to germinate?

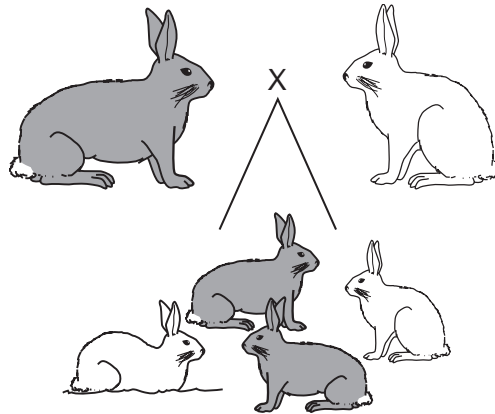


31 In living organisms, how may males and females be distinguished?

- A amount of muscle
- B body colour
- C gametes
- D size

32 In rabbits, the allele for dark fur, R, is dominant to the allele for white fur, r.

The diagram shows a cross between a rabbit with dark fur and a rabbit with white fur.



What are the genotypes of the offspring?

- A all Rr
- B RR and rr
- C RR and Rr
- D Rr and rr

33 The diagram shows a food chain.

grass → wildebeest → lion

What do the arrows represent?

- A digestion
- B energy flow
- C heat loss
- D respiration

34 Which is a food chain made up of a producer, herbivore and carnivore?

- A bee → bee-eater → hawk
- B hen → rat → owl
- C maize → mouse → eagle
- D sun → grass → sheep

35 Which organisms remove carbon dioxide from the atmosphere?

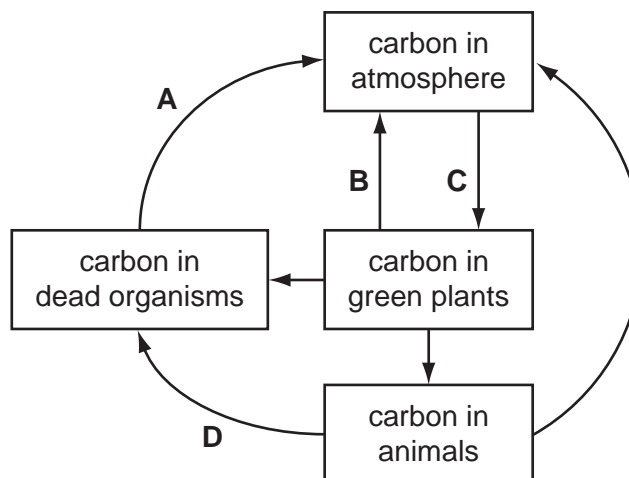
- A carnivores
- B decomposers
- C herbivores
- D producers

36 What are the effects of sewage pollution on the oxygen concentration and the number of bacteria in a river?

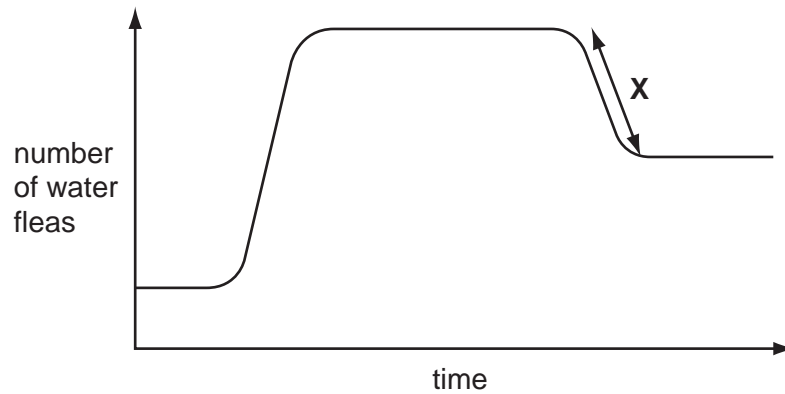
| | oxygen concentration | number of bacteria |
|---|----------------------|--------------------|
| A | decreases | decreases |
| B | decreases | increases |
| C | increases | decreases |
| D | increases | increases |

37 The diagram shows part of the carbon cycle.

Which arrow shows respiration in decomposers?



38 The graph shows the numbers of water fleas in a newly-created pond.



What might have been responsible for the section X on the graph?

- A addition of extra oxygenating plants to the pond
 - B increase in the birth rate of the water fleas
 - C increase in the food supply for the water fleas
 - D addition of predators which feed on water fleas
- 39 Which is a reason for conserving plant species?
- A to absorb oxygen from the air
 - B to decrease rainfall
 - C to obtain drugs for medicinal use
 - D to release carbon dioxide into the air
- 40 The table shows the numbers of fish in a river downstream of a factory that started to release waste hot water into the river in 1990.

| number of fish in | species | | | | | | | | |
|-------------------|---------|-----|------|------|---|---|-----|----|----|
| | L | M | N | O | P | Q | R | S | T |
| 1990 | 20 | 100 | 5000 | 1100 | 2 | 3 | 85 | 0 | 0 |
| 1992 | 150 | 2 | 100 | 65 | 0 | 0 | 560 | 30 | 26 |

What effect did the hot water have on the fish?

- A a decrease in the number of species
- B a decrease in the total number of fish
- C an increase in the number of species
- D an increase in the total number of fish

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